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10/576,720	12/13/2006	Kiminobu Hirata	050203-0149	4387

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EXAMINER	
TRAN, BINH Q	
ART UNIT	PAPER NUMBER
3748	
MAIL DATE	DELIVERY MODE
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/576,720	HIRATA ET AL.	
	Examiner	Art Unit	
	BINH Q. TRAN	3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *01/08/2008; 04/04/2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-20* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-4,7-12 and 14-20* is/are rejected.

7)☒ Claim(s) *5-6, 13* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

This office action is in response to the amendments filed January 08, 2008, and April 04, 2008.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) and the Intellectual Property and High Technology Technical Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting directly or indirectly from an international application filed before November 29, 2000. Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1-4, 7-11, and 15-20 are rejected under 35 U.S.C. 102 (b) as being anticipated by Murphy et al. (Murphy) (Patent Number 6,487,852).

Regarding claims 1, and 19-20, Murphy discloses engine control apparatus and method (e.g. 10) configured to be in cooperation with an engine (14), the engine including an addition device (e.g. 16) for adding a NOx reducing agent to exhaust gas of the engine, the engine control

apparatus comprising: a control unit (e.g. 26) for controlling the engine, wherein the control unit is configured to detect an abnormality occurrence in the addition device, and to restrict an output torque of the engine (**e.g. Speed, Load, RPM, Mass Air Flow (MAF)**) in response to detecting the abnormality occurrence in the addition device (16) (e.g. See col. 4, lines 1-67; col. 5, lines 1-48).

Regarding claim 2, Murphy further discloses wherein at the time of the abnormality occurrence, the control unit varies an output characteristic of the engine relative to an accelerator operation by a driver from that at a normal time other than the time of the abnormality occurrence (e.g. See col. 3, lines 36-67; col. 5, lines 3-48).

Regarding claim 3, Murphy further discloses wherein the control unit changes a fuel supply quantity to the engine at the time of the abnormality occurrence from that at the normal time, under the same accelerator operating amount, to vary the output characteristic of the engine (e.g. See col. 3, lines 36-67; col. 5, lines 3-48).

Regarding claim 4, Murphy further discloses wherein, on the basis of the same accelerator operating amount, the control unit decreases the fuel supply quantity at the time of the abnormality occurrence than that at the normal time (e.g. See col. 3, lines 36-67; col. 5, lines 3-48).

Regarding claim 7, Murphy further discloses wherein the engine is mounted on a vehicle, and wherein the control unit detects a vehicle speed, and varies the fuel supply quantity only when the detected vehicle speed is larger than a predetermined value (e.g. See col. 4, lines 1-67; col. 5, lines 1-48).

Regarding claim 8, Murphy further discloses wherein the control unit inhibits restarting of the engine operation after the engine operation stops, to restrict the output of the engine (e.g. See col. 4, lines 1-67; col. 5, lines 1-48).

Regarding claim 9, Murphy further discloses wherein the control unit breaks the connection between a starter for cranking the engine, and a power supply unit for the starter, to thereby inhibit the restarting of the engine operation (e.g. See col. 4, lines 1-67; col. 5, lines 1-48).

Regarding claim 10, Murphy further discloses wherein the control unit inhibits the fuel supply to the engine, to thereby inhibit the restarting of the engine operation (e.g. See col. 4, lines 1-67; col. 5, lines 1-48).

Regarding claim 11, Murphy further discloses wherein the control unit stops the engine operation after a predetermined period of time has elapsed from detection of the abnormality occurrence (e.g. See col. 4, lines 1-67; col. 5, lines 1-48).

Regarding claim 15, Murphy further discloses wherein the NOx reducing agent is ammonia (e.g. See col. 4, lines 1-67; col. 5, lines 1-48).

Regarding claim 16, Murphy further discloses wherein the addition device adds urea as a precursor of ammonia to the exhaust gas, to thereby add the NOx reducing agent (e.g. See col. 4, lines 1-67; col. 5, lines 1-48).

Regarding claim 17, Murphy further discloses wherein at the time of the abnormality occurrence, the control unit operates a warning device for notifying a driver of the abnormality occurrence (e.g. See col. 4, lines 1-67; col. 5, lines 1-48).

Regarding claim 18, Murphy further discloses a first control unit for controlling the engine, and a second control unit for controlling the addition device, wherein the second control unit controls the addition device at both of the time of the abnormality occurrence, and a normal time other than the time of the abnormality occurrence, and the second control unit, at the normal time, operates the addition device to add the NOx reducing agent by an amount according to engine operating conditions, while at the time of the abnormality occurrence, stops the adding of the NOx reducing agent by the addition device (e.g. See col. 4, lines 1-67; col. 5, lines 1-48).

Claims 1-4, 7-12, and 14-20 are rejected under 35 U.S.C. 102 (b) as being anticipated by Van Nieuwstadt et al. (Van Nieuwstadt) (Patent Number 6,546,720).

Regarding claims 1, and 19-20, Van Nieuwstadt discloses engine control apparatus and method (e.g. 10) configured to be in cooperation with an engine (14), the engine including an addition device (e.g. 16) for adding a NOx reducing agent to exhaust gas of the engine, the engine control apparatus comprising: a control unit (e.g. 12) for controlling the engine, wherein the control unit is configured to detect an abnormality occurrence in the addition device, and to restrict an output torque of the engine **(e.g. Speed, Load, RPM, Mass Air Flow (MAF))** in response to detecting the abnormality occurrence in the addition device (16) (e.g. See col. 9, lines 1-67; col. 10, lines 1-31).

Regarding claim 2, Van Nieuwstadt further discloses wherein at the time of the abnormality occurrence, the control unit varies an output characteristic of the engine relative to an accelerator operation by a driver from that at a normal time other than the time of the abnormality occurrence (e.g. See col. 9, lines 1-67; col. 10, lines 1-31).

Regarding claim 3, Van Nieuwstadt further discloses wherein the control unit changes a fuel supply quantity to the engine at the time of the abnormality occurrence from that at the normal time, under the same accelerator operating amount, to vary the output characteristic of the engine (e.g. See col. 9, lines 1-67; col. 10, lines 1-31).

Regarding claim 4, Van Nieuwstadt further discloses wherein, on the basis of the same accelerator operating amount, the control unit decreases the fuel supply quantity at the time of the abnormality occurrence than that at the normal time (e.g. See col. 3, lines 36-67; col. 5, lines 3-48).

Regarding claim 7, Van Nieuwstadt further discloses wherein the engine is mounted on a vehicle, and wherein the control unit detects a vehicle speed, and varies the fuel supply quantity only when the detected vehicle speed is larger than a predetermined value (e.g. See col. 9, lines 1-67; col. 10, lines 1-31).

Regarding claim 8, Van Nieuwstadt further discloses wherein the control unit inhibits restarting of the engine operation after the engine operation stops, to restrict the output of the engine (e.g. See col. 9, lines 1-67; col. 10, lines 1-31).

Regarding claim 9, Van Nieuwstadt further discloses wherein the control unit breaks the connection between a starter for cranking the engine, and a power supply unit for the starter, to thereby inhibit the restarting of the engine operation (e.g. See col. 9, lines 1-67; col. 10, lines 1-31).

Regarding claim 10, Van Nieuwstadt further discloses wherein the control unit inhibits the fuel supply to the engine, to thereby inhibit the restarting of the engine operation (e.g. See col. 9, lines 1-67; col. 10, lines 1-31).

Regarding claim 11, Van Nieuwstadt further discloses wherein the control unit stops the engine operation after a predetermined period of time has elapsed from detection of the abnormality occurrence (e.g. See col. 9, lines 1-67; col. 10, lines 1-31).

Regarding claim 12, Van Nieuwstadt further discloses wherein the engine comprises a tank for storing an aqueous solution of the NOx reducing agent or an precursor thereof, which is added to the exhaust gas by the addition device, and wherein the control unit comprises a first sensor (26) for detecting a concentration of the NOx reducing agent or the precursor contained in the aqueous solution stored in the tank, and when a value of the concentration detected by the first sensor is out of a predetermined range, detects the abnormality occurred in the addition device (e.g. See col. 9, lines 1-67; col. 10, lines 1-31).

Regarding claim 14, Van Nieuwstadt further discloses wherein the engine comprises a tank for storing an aqueous solution of the NOx reducing agent or a precursor thereof, which is added to the exhaust gas by the addition device, and wherein the control unit comprises a second sensor for detecting a residual quantity of the aqueous solution stored in the tank, and when a value of the residual quantity detected by the second sensor is smaller than a predetermined value, detects the abnormality occurred in the addition device (e.g. See col. 9, lines 1-67; col. 10, lines 1-31).

Regarding claim 15, Van Nieuwstadt further discloses wherein the NOx reducing agent is ammonia (e.g. See col. 9, lines 1-67; col. 10, lines 1-31).

Regarding claim 16, Van Nieuwstadt further discloses wherein the addition device adds urea as a precursor of ammonia to the exhaust gas, to thereby add the NOx reducing agent (e.g. See col. 9, lines 1-67; col. 10, lines 1-31).

Regarding claim 17, Van Nieuwstadt further discloses wherein at the time of the abnormality occurrence, the control unit operates a warning device for notifying a driver of the abnormality occurrence (e.g. See col. 9, lines 1-67; col. 10, lines 1-31).

Regarding claim 18, Van Nieuwstadt further discloses a first control unit for controlling the engine, and a second control unit for controlling the addition device, wherein the second control unit controls the addition device at both of the time of the abnormality occurrence, and a normal time other than the time of the abnormality occurrence, and the second control unit, at the normal time, operates the addition device to add the NOx reducing agent by an amount according to engine operating conditions, while at the time of the abnormality occurrence, stops the adding of the NOx reducing agent by the addition device (e.g. See col. 9, lines 1-67; col. 10, lines 1-31).

Allowable Subject Matter

Claims 5-6, and 13 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Since allowable subject matter has been indicated, applicant is encouraged to submit ***Final Formal Drawings (If Needed)*** in response to this Office action. The early submission of formal drawings will permit the Office to review the drawings for acceptability and to resolve any informalities remaining therein before the application is passed to issue. This will avoid possible delays in the issue process.

Response to Arguments

Applicant's arguments filed January 08, 2008 have been fully considered but they are not completely persuasive. Claims 1-20 are pending.

Applicants have argued that any one of Murphy et al. and Van Nieuwstadt et al. do not teach or suggest Applicant's claimed invention. More specifically, Applicants assert that the references to both Murphy et al. and Van Nieuwstadt fail to disclose that "*the control unit to restrict an output torque of the engine in response to detecting the abnormality occurrence in the addition device*". The examiner respectfully disagrees, in column 3, lines 44-67; and column 4, lines 1-30, Murphy has clearly disclosed that "*(4) The processor 26 includes a look up table 30 for determining a nominal portion,* ***HC_NOM, of the control signal on line 18. The nominal portion, HC_NOM, represents a nominal amount of the hydrocarbon to be injected into the engine exhaust. The nominal amount, HC_NOM, is a function of*** *a plurality of operating parameters including* ***engine operating conditions and catalyst temperature, T_cat.*** *More particularly, here the nominal portion,* ***HC_NOM, of the control signal is a function of engine speed, engine load,*** *EGR level, start of fuel injection (SOI), catalyst temperature, T_cat, and space velocity (SV). The processor 26 includes a variable control signal generator for producing a time variable portion, k_i*Z(t) of the control signal on line 18, to be described in detail below. ... . .* **Further, as will be described in detail below, Z(t) also provides an indication of whether the hydrocarbon injector 16 is defective, (e.g., plugged or leaking)"**. *Thus, referring to the FIGURE, the time variable portion of the control signal k_i*Z(t) is provided by processor 26 determining the difference between the temperature sensors 22, 24 in subtractor 32 to thereby provided Texo_meas=T_downstream-T_upstream, where*

T_downstream is the temperature sensed by sensor 24 and T_upstream is the temperature measured by sensor 22. ***A look-up table 31 produces an expected exotherm, Texo_expected across the catalyst for a the nominal HC determined by the look up table 31 for the nominal HC level HC_NOM for the injector 16, and the current engine and catalyst operating conditions.*** *If this nominal amount of HC, HC_NOM were in fact injected into the engine exhaust 12, the expected exotherm, Texo_expected, would be produced across the catalyst 20.* ***Thus, an expected exotherm Texo_expected, is determined by the look up table based on the HC_NOM signal and the current engine and catalyst operating conditions.*** *Any difference between the expected exotherm, Texo_expected, and the actual exotherm produced across the catalyst, Texo_meas, would result in an error signal, Texo_diff=Texo_meas-Texo_expected. This error signal Texo_diff is an exotherm difference signal. The error signal Texo_diff is determined by a subtractor 34. The error signal Texo_diff is fed to: to a pair of comparators 38, 40, as shown. Also fed top the comparators 38, 40 are upper and lower threshold signals Texo_thres_pos and Texo_thres_neg, respectively, provided by the look up table 30 in accordance with the* ***engine operating parameters*** *and the catalyst temperature. ...* ***The output of the integrator Z(t) is fed to a multiplier 42 for multiplication with the scale factor k_i. The resulting product, k_i*Z(t) is algebraically summed with the HC_NOM in summer 48. The algebraic sum of HC_NOM and k_i*Z(t) provided the control signal on line 18 for the HC injector 16"***. It is clearly that Murphy has show a control unit (30) to restrict an output torque of the engine (**e.g. Speed, Load, RPM, Mass Air Flow (MAF))** in response to detecting the abnormality occurrence in the addition device (16) (***HC_NOM*).**

I addition, in column 9, lines 10-67; and column 10, lines 1-30, Van Nieuwstadt has clearly disclosed "*More particularly, the final urea quantity to be applied via the injector 16 is:*

*u_tot_ppm:=(k_base+k_corr)*nox1+u_exc; where k_base is the nominal urea : NOx ratio.*

*To put it another way, a priori determined injection signal u.sub.0 =nox1*k_base is modulated by both the correction signal k_corr*nox1 and the square wave signal u_exc. At correct stoichiometry, (k_corr+k_base)*k_injector*nox1 results in the injector 16 delivering stoichiometric urea to the engine exhaust upstream of the catalyst 20. ...* ***If k_corr>k_corr_lmx, where k_corr_lmx is the maximum limit for the correction factor k_corr to be declared a failure, (i.e., a blocked injector 16 or a catalyst 20 failure) as determined by comparator 47, a system failure has occurred (i.e., the catalyst 20 is inactive or the injector 16 is blocked). If k_corr<k_corr_lmn<0, where k_corr_mn is the minimum limit for the correction factor k_corr to declare a system failure for a leaking urea injector,*** *as determined by comparator 49, a system failure has occurred, i.e., the injector is leaking, and excess urea will shorten the life of the exhaust system. For example, for detection of a 50 percent increase, k_corr_lmx is set=0.5. ... The process described above in connection with FIG. 5 may be summarized as follows: The following measured inputs are used: Nox1: Nox sensor signal measured before the SCR brick (in ppm) Nox2: Nox sensor signal measured after the SCR brick (part of this output is due to urea slip) (in ppm)* ***MAF: mass air flow*** *T1: temperature upstream of the SCR brick Wf: fuel flow (Maf, T1 and Wf are used to convert the urea ppm quantity to a quantity in mg/sec.) The following gains are used and to be calibrated based on experimental data.* ***They may dependent on engine operating conditions (speed and load)*** *and exhaust temperature. A_du: the amplitude of the negative part of the excitation T_du: the period of the excitation is T_du k_urea: sensitivity of the Nox sensor wrt urea k_nox: sensitivity of*

the Nox sensor wrt urea (A_du, k_urea and k_nox determine the amplitude of the positive part of the excitation). kf_lp_nox2: filter gain for low pass filtered nox2. kf_rk: time constant of nox-urea reaction kinetics. k_base: nominal urea:nox ratio ki: integral gain to correct the nominal urea:nox ratio k_dydu_thres: threshold for correction contribution to determine whether further adjustment is needed. ***k_corr_lmx: maximum limit for correction factor to declare an OBD failure (blocked injector or catalyst malfunction), k_corr_lmn: minimum limit for correction factor to declare a system failure (leaking injector).*** ". It is also clearly Van Nieuwstadt has show a control unit (10, 15) to restrict an output torque of the engine **(e.g. Speed, Load, RPM, Mass Air Flow (MAF))** in response to detecting the abnormality occurrence in the addition device (16) (e.g. ***k_corr_lmx, k_corr_lmn*).**

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Binh Tran whose telephone number is (571) 272-4865. The examiner can normally be reached on Monday-Friday from 8:00 a.m. to 4:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion, can be reach on (571) 272-4859. The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/BINH Q. TRAN/
Binh Q. Tran
Primary Examiner, Art Unit 3748
July 05, 2008